

Translation

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BET 03P0795	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/002697	International filing date (day/month/year) 11 septembre 2003 (11.09.2003)	Priority date (day/month/year) 11 septembre 2002 (11.09.2002)
International Patent Classification (IPC) or national classification and IPC C07C 327/36, C07D 317/36, C07F 7/08, C07D 209/48, C07F 9/40, C07D 207/26, C07C 233/18, C07D 209/14, C07C 231/12, 233/13		
Applicant RHODIA CHIMIE		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 17 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19 mars 2004 (19.03.2004)	Date of completion of this report 02 March 2005 (02.03.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR2003/002697

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages 1-117, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages 1-43, filed with the letter of 18 October 2004 (18.10.2004)
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 1,7-9,14,15,23,25,26,40,41 (in part of)

because:

- ☐ the said international application, or the said claims Nos. _____ relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____ are so unclear that no meaningful opinion could be formed (*specify*):

- ☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for said claims Nos. 1,7-9,14,15,23,25,26,40,41 (in part of)

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX III

**Non-establishment of opinion with regard to novelty,
inventive step and industrial applicability**

The international search report was incomplete for part of the scope of claims 1, 7-9, 14, 15, 23, 25, 26, 40 and 41. It was complete only for the compounds defined in claims 2 and 42 (original version).

Consequently, it is not possible to carry out a complete international preliminary examination with regard to claims 1, 7-9, 14, 15, 23, 25, 26, 40 and 41 (PCT Rule 66.1(e)).

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-39, 41-43	YES
	Claims	40	NO
Inventive step (IS)	Claims	1-38, 43	YES
	Claims	39-42	NO
Industrial applicability (IA)	Claims	1-43	YES
	Claims		NO

2. Citations and explanations

This report makes reference to the following documents:

- D1:** R.N. Haszeldine, Journal of the Chemical Society, 1952, 2504-2513
- D2:** T. Gouyon et al., Journal of Organometallic Chemistry, 1990, 394(1/3), 37-44
- D3:** A. Posta et al., Collection of Czechoslovak Chemical Communications, 1973, 39(10), 2801-2807
- D4:** P. Delduc et al., Journal of the Chemical Society, Chemical Communications, 1988, (4), 308-310

Documents D1-D3 were not cited in the international search report.

1. Claimed subject matter

The present application relates to compounds of formula $Rf-C(X)(Z_4)-S-C(=S)-Z_1$ (claims 1-18), their preparation (claims 19-22), their use for synthesising a plurality of compounds by radical addition (claims 23-27, 32, 33, 43) and the thus synthesised compounds (claims 28, 34, 39 in part, 40-42). It also relates to the use of the latter products for preparing further compounds (claims 35-38), as well as the further compounds themselves

(claim 39, in part).

2. **Novelty**

The present application does not meet the requirements of PCT Article 33(1) because the subject matter of claim 40 does not meet the requirement of PCT Article 33(2) for novelty.

Document D1 describes 2,3-dibromo-1,1,1,4,4,4-hexafluorobutane (page 2511, lines 22-27), which is a compound as per claim 40 in which X stands for a bromine atom, Rf for a trifluoromethyl group and Z4 for a hydrogen atom.

Document D2 describes 1,2-dibromo-1,2-difluorononane (page 43, compound 6), which is a compound as per claim 40 in which X stands for a bromine atom, Rf for a fluorine atom, one of the Z₄ groups standing for a heptyle group and the other Z₄ for a hydrogen atom.

Document D3 describes 1,2-dibromo-1,2-difluoroethane (page 2805, compound IV), which is a compound as per claim 40 in which X stands for a bromine atom, Rf for a fluorine atom and Z₄ for a hydrogen atom.

3. **Inventive step**

The present application does not meet the requirements of PCT Article 33(1) because the subject matter of claims 39-42 does not involve an inventive step (PCT Article 33(3)).

Document D4, which is considered to represent the prior art closest to the subject matter of claims 1-43, insofar as these claims are novel, describes S-

alkyl and S-acyl xanthates of formula $R-S(C=S)OR'$ and their use as sources of R radicals trapped by various alkenes. The radicals in D4 are structurally different from those in the present invention.

The present invention can therefore be considered to address the problem of providing further compounds comprising a thiocarbonyl sulfanyl grouping and useful as sources of radicals. This problem was solved by the use of the compounds of formula (I) as defined in claim 1.

Neither D4 nor any other prior art document suggests that the compounds of formula (I) could form radicals which would be stable enough to be useful in synthesis reactions of the types defined in claims 32 and 35-38. The solution proposed in claims 1-38 and 43 of the present application, insofar as these claims are novel, can therefore be considered inventive (PCT Article 33(3)).

The compounds as per claims 39-42 are the reaction products of the compounds of formula (II) or of the dimerisation of radicals of formula XZ_4RfC . The applicant has not demonstrated any surprising effect of these compounds. In the absence of a surprising effect, no inventive step can be recognised in the subject matter of claims 39-42.